BY ORDER OF THECOMMANDER
341ST MISSILE WING

341ST MISSILE WING INSTRUCTION
15-101

8 MARCH 2016

Weather

WEATHER SUPPORT DOCUMENT

COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

ACCESSIBILITY: Publications and forms are available on the e-publishing website at **http://www.e-publishing.af.mil** for downloading and ordering.

RELEASABILITY: There are no releasability restrictions on this publication.

OPR: 341 OSS/OSW

Certified by: 341 OSS/CC
(Lt Col Austin L. Holthaus)

Supersedes: 341MWI 15-101, 23 October 2013

Pages: 55

This instruction complements Air Force Policy Directive (AFPD) 15-1, *Air Force Weather Operations,* Air Force Instruction 15-114, *Functional Resource and Weather Technical Performance Evaluation,* Air Force Instruction 10-206, *Operational Reporting,* AFMAN 15-111, *Surface Weather Observations,* AFMAN 15-124, *Meteorological Codes,* Air Force Instruction 15-128, *Air Force Weather Roles and Responsibilities,* AFMAN 15-129 vol. 1, *Air and Space Weather Operations—Characterization,* AFMAN 15-129V2, *Air and Space Weather Operations—Exploitation,* AFI 10-2501, *Air Force Emergency Management (EM) Program Planning and Operations,* AFI 91-203, *Air Force Consolidated Occupational Safety Instruction,* and also establishes responsibilities and weather support procedures for Malmstrom AFB. It provides general information for weather services, including weather observations and forecasts; weather warnings, watches, and advisories; dissemination of information; and reciprocal support. It applies to units assigned to the 341st Missile Wing and subordinate units, and units assigned to, or supported by, Malmstrom Air Force Base. This instruction does not apply to the Air National Guard (ANG) or the Air Force Reserve (AFRC). Waivers to this instruction are not authorized. Refer recommended changes and questions about this publication to the Office of Primary Responsibility (OPR) using AF Form 847, *Recommendation for Change of Publication*; route AF Form 847 through the wing publishing office. Ensure that all records created as a result of processes prescribed in this publication are maintained IAW Air Force Manual (AFMAN) 33-363, *Management of Records,* and disposed of IAW Air Force Records Information Management System (AFRIMS) Records Disposition Schedule (RDS).

SUMMARY OF CHANGES

This document contains minor changes that reflect updated regulations, telephone numbers, and supporting agencies. Supported agencies will maintain the current level of weather support received since the previous revision.

Chapter 1

GENERAL INFORMATION

1.1. General.

1.1.1. The 341st Operations Support Squadron, Weather Flight (341 OSS/OSW), is responsible for providing or arranging weather support for the 341 MW and all other Malmstrom AFB agencies. This instruction establishes weather support requirements and procedures as outlined in Air Force directives and has been coordinated at the local level to meet the mission needs of all supported customers. The 341 OSS/OSW is the focal point for all weather-related issues and serves as a one stop shop for all things weather. This instruction establishes requirements and procedures pertaining to weather support during peacetime operations. This instruction will be reviewed annually and updated as required.

1.1.2. Contacting the 341 OSS/OSW: Weather personnel can be reached by phone at:

DSN: 632-2710/2463	Fax DSN: 632-2563
COMM: 406-731-2710/2463	Fax COMM: 406-731-2563

During non-duty hours, the 341 OSS/OSW can be reached via Command Post at DSN: 632-3801.

1.1.3. References, abbreviations, acronyms, and certain terms used in this document are defined in Attachment 1.

1.2. Concept of Operations (Operational Weather Squadron (OWS)-Weather Flight Concept).

1.2.1. The 25 OWS at Davis-Monthan AFB, Arizona provides regional and operational-level weather products and information to Air Force units in the western regions of the Continental United States (CONUS) and Canada.

1.2.2. Based on the guidance in the Strategic Plan, the 341 OSS/OSW at each Air Force location will focus on providing tactical-level weather products and information needed for mission execution and provide weather products and information to the commander of deployed forces during wartime, contingency, and exercise operations.

1.3. Responsibilities. The 25 OWS provides timely, accurate, and relevant weather information and products for Air Force and Army operations in the western U.S. AOR. Forecast products for Malmstrom AFB are produced in collaboration with the 341 OSS/OSW. Additionally, the 341 OSS/OSW will support the base in thoroughly educating agencies on the purpose, applicability, and operating procedures of weather products and base operations as required by directives (AFI 10-2501) or directed by the 341 MW Commander (341 MW/CC).

1.4. Duty Priorities.

1.4.1. 25 OWS duty priorities. In the event of task saturation, 25 OWS prioritizes support tasks in accordance with Tables 1.1. and 1.2. Note: 25 OWS backup procedures may force a

temporary adjustment in duty priorities to circumvent problems associated with outages and system failures.

Table 1.1. 25 OWS Mission Execution Support Duty Priority Listing.

Order of Priority	Duties
1	Perform Emergency War Order Tasks; Support Combat, Contingency and Military Operations Other Than War (MOOTW); and/or Support Western Air Defense Sector (WADS) Operations
2	Support Organizations During Aircraft/Ground Emergencies
3	Execute 25 OWS Building Evacuation
4	Provide Pilot-to-Metro (PMSV) Service
5	Disseminate Urgent Pilot Reports (PIREPs)/Air Reports (AIREPs), (UUA) Reports
6	Provide Scheduled Flight Weather Mission Execution Forecasts (MEFs), including Controlling Mission Execution Forecasts (CMEFs)
7	Provide Unscheduled Flight Weather MEFs
8	Prepare and Disseminate Graphical Aviation Weather Products
9	Provide Other Air and Space Weather Products, Information, and Weather Briefings
10	Accomplish Administrative Tasks and Recurring Training

Table 1.2. 25 OWS TAF/METWATCH Duty Priority Listing.

Order of Priority	Duties
1	Perform Emergency War Order Tasks; Support Combat, Contingency and Military Operations Other Than War (MOOTW); and/or Support Western Air Defense Sector (WADS) Operations
2	Support Organizations During Aircraft/Ground Emergencies
3	Execute 25 OWS Building Evacuation
4	Provide Resource Protection Forecasts (Weather Watches, Warnings, and Advisories)
5	Prepare and Disseminate Military Operating Area Forecasts (MOAFs) and Terminal Aerodrome Forecasts (TAFs)
6	Provide Scheduled Controlling Mission Execution Forecasts (CMEFs)
7	Provide Air and Space Weather Products, Information, and Weather Briefings
8	Accomplish Other Routine Weather Requirements
9	Accomplish Administrative Tasks and Recurring Training

1.4.2. The 341 OSS/OSW provides or arranges for weather support to the 40th Helicopter Squadron (40 HS) and all other Malmstrom AFB agencies. Weather support includes tailored mission execution forecasts for helicopter missions, ground support mission, mission watch (MISSIONWATCH) functions, flight weather briefings, Crisis Action Team (CAT) briefings, aircrew and staff briefings, exercise/contingency support, climatology briefings

and resource protection services for Malmstrom AFB. Weather products tailored specifically to meet customer requirements.

Table 1.3. 341 OSS/OSW Duty Priority Listing.

Order of Priority	Duties
1	Perform Emergency War Order (EWO) Taskings
2	Execute 341 OSS/OSW Evacuation
3	Respond to Aircraft/Ground Emergencies. (These include aircraft emergencies and mishaps, accidental release of toxic chemicals, or any operation involving the safety of aircraft, material, or personnel)
4	Support Airborne Aircraft via Pilot to Metro Service (PMSV)
5	Provide 40 HS Supervisor of Flying (SOF) Support
6	Issue Observed Weather Warnings or Advisories and initiate SWAP if applicable
7	Augment the FMQ-22 / Provide "Eyes Forward" Support to the 25 OWS
8	Collaborate/Coordinate weather support with the 25 OWS
9	Produce and disseminate Mission Execution Forecasts (MEF)
10	Disseminate Urgent PIREPs/AIREPs first (relay to 25 OWS), then all other PIREPs/AIREPs
11	Perform MISSIONWATCH Activities
12	Provide Briefing Support
13	Conduct Weather Functional Training
14	Accomplish Administrative and Other Duties

1.5. Operational Hours. Airfield services will be provided from 0400 until mission completion M-F and 0500-0700L or until mission completion on weekends. Staff services, listed in **Chapter 5**, are available during normal duty hours or as required. The 341 OSS/OSW will always have a standby forecaster on duty after hours and can be reached via Command Post.

1.6. Backup Weather Support Procedures.

1.6.1. If the 341 OSS/OSW is unable to provide weather support for any reason, the 25 OWS will provide backup support according to the following three tiers of mission support outlined in Table 1.4.

1.6.2. Backup power requirements. The 341 OSS/OSW operations section is located in Bldg. 300 which has no backup generator power. In the event of power failure, 341 OSS/OSW operations will move to the alternate operating location (AOL) as outlined in paragraph **1.7** If the AOL is also without power, the 25 OWS will provide backup support according to the three tiers of mission support outlined in Table 1.4.

Table 1.4. Three-Tier Backup Support Priority Table.

Mission	Types of Products and Services	Backup Priority
Tier 1a. Wartime, contingency, and military operations other than war.	Wartime-related MEFs, alert weather briefings, other real world contingency MEFs, and flight	Must back up. Immediate transfer to backup unit

Tier 1b. Resource protection.	weather briefs. Forecast weather watches, warnings, and advisories	
Tier 2. Peacetime and exercise operations.	MEFs for local training and exercises, IFR/VFR route forecasts, air refueling route forecasts, etc.	Backed up by 25 OWS after Tier 1 priorities have been met.
Tier 3. Mission Planning	Three-day outlook forecast, climatology requests, staff support, etc.	Backed up as resources become available after Tier 1 and 2 priorities have been met.

1.6.3. 25 OWS backup weather support procedures. When weather operations at the 25 OWS are interrupted for any reason (e.g. power outage, natural disaster, etc.) the responsibility for Malmstrom AFB's TAFs, weather watches, warnings, and advisories will be transferred to the 341 OSS/OSW until such time as the 25 OWS can resume operations.

1.6.4. Airfield services will be provided 24-hours a day during real world contingencies or as directed by 341 MW/CC.

1.7. Alternate Operating Location (AOL).

1.7.1. In the event the 341 OSS/OSW evacuates, operations will resume in room 101 of the Fire Department, Building 349. (See Attachment 2 for map).

1.7.2. Affected agencies (40 HS, CP, 25 OWS, Missile Maintenance Operations Center (MMOC) and Transportation Control Function (TCF)) will be notified of the evacuation and subsequent return to the primary work center.

1.7.3. Wind and pressure values from any form of back up equipment will be estimated while at the AOL.

1.7.4. The AOL has the following limitations:

1.7.4.1. Building 349 blocks the view to the northwest.

1.8. Release of Weather Information to Non-Department of Defense (DoD) Agencies and Individuals. Weather information will not be released to non-government agencies or the general public without approval from Public Affairs Office (341 MW/PA) and Staff Judge Advocate (341 MW/JA). Any questions/clarifications will be coordinated through the 341 OSS/OSW CC/NCOIC.

1.9. Post-Mission Analysis/Feedback.

1.9.1. Per AFMAN 15-129, units that regularly utilize weather support from Malmstrom's 341 OSS/OSW will provide post-mission/utilization feedback, when possible. Customers have opportunity to provide feedback via reverse side of the daily flimsy and communications listed below. This information will be used to ensure proper quality assurance (QA) and to provide a metrics database. Informal feedback methods include:

1.9.1.1. Email the flight commander, NCOIC, or 341 OSS/OSW organizational email (**341oss.osw2@us.af.mil**).

1.9.1.2. Phone calls to the flight commander (731-3268) or NCOIC (731-3267).

1.9.1.3. Face to face feedback after any briefing.

1.9.2. The 341 OSS/OSW will, in turn, utilize this data to refine their mission support role and gauge unit strengths and weaknesses. Representative sample sizes are necessary to accurately reflect the satisfaction and accuracy of the weather support being provided to Malmstrom's flying units and ground units by the 341 OSS/OSW.

1.10. Mishap Procedures. 341 OSS/OSW members have a role when the airfield is advised of an emergency or mishap. The 557th Weather Wing and the 25 OWS are also involved. In general, the 341 OSS/OSW will ensure applicable data used in the development of any weather product, and/or service provided/saved for an investigation (to include MEFs, model output, space weather products, mission impact slides, etc.) is saved.

1.11. Change Requests. All supported units should coordinate with the 341 OSS/OSW leadership to change this instruction or request special or additional support not addressed in this instruction.

Chapter 2

MISSION INFORMATION

2.1. General. This chapter will identify local weapons systems, the most common missions, and operating areas, and weather sensitivities associated with the organization, weapons systems, missions, and aircrews.

2.2. Supported Organization/Mission/Requirements. The 341 OSS/OSW provides weather support to the following organizations (and their associated units) with the accompanying missions and requirements:

Table 2.1. Malmstrom AFB Agency/Mission/Requirement Listing.

Organization	Mission	Requirements
40 HS	Provide helicopter support for Malmstrom AFB and the missile complex	All WWA see Chapter 8
341st Missile Operation Squadron (341 MOS)	Provide truck transportation for parts and components for the Minuteman III missile systems	All WWA see Chapter 8
TCF	Monitor and track all ground movements in the missile complex	All WWA see Chapter 8

2.3. Geographic Area of Responsibility. The 341 OSS/OSW provides mission tailored weather support for Malmstrom AFB and the missile complex.

2.4. Airframe specific weather limitations.

Figure 2.1. UH-1N Huey.

Table 2.2. UH-1N Huey Facts.

Aircraft Category Type	Cat I

Manufacturer	Bell
Power Plant	(2) Pratt & Whitney @ 916 shp each
Cruise Speed	90-100 kts
Top Speed	130 kts
Complex Cruise Altitude	100-500 ft AGL
Max Cruise Altitude	15,000 ft MSL
Aircraft Weight	6,000 lbs
Max Takeoff Weight	10,500 lbs
Turbulence	MDT or Below
Icing	None (no icing equipment)

Table 2.3. UH-1N Weather Limitations.

Criteria	**Impact**
Ceiling ≤ 700 ft **	Recommend cancel training missions. Security missions still a go.
Ceiling ≤ 500 ft	Recommend cancel all missions
Visibility ≤ 2 Mile **	Recommend cancel training missions. Security missions still a go.
Visibility ≤ 1 Mile	Recommend cancel all missions
Surface Wind Gust Spread > 20 Knots **	Recommend no training flights
Surface Wind 40-45 Knots (non-convective)	Recommend no training flights
Surface Wind ≥ 45 Knots (non-convective)	Recommend cancel Takeoffs/landings. (Cancel Start-ups / Shut Downs)
Freezing Precipitation (any amount)	Recommend cancel all operations
Turbulence – Severe or Extreme (forecast)	Recommend change routes or cancel missions
LLWS **	Recommend change routes or cancel missions
Icing – Light or Greater	Recommend protect aircraft, cancel operations
Lightning within 5NM	Recommend protect aircraft, delay operations
Hail ≥ ¾”	Recommend protect aircraft, delay operations

****** Should be briefed to pilots if PIREPs confirm the existence of these criteria; however no watch or advisory is needed. Per the 40 HS/CC, they are not considered significant enough to necessitate the issuance of a separate watch or advisory.

Figure 2.2. Payload Transport (PT).

Table 2.4. PT Weather limitations.

Criteria	Impact
Winds, Sustained > 35 kts	Should not be moved
Winds, Gust > 52 kts	Should not be moved

Figure 2.3. Transport Erector (TE).

Table 2.5. TE Weather limitations.

Criteria	Impact
Winds, Gust > 35 kts	Cannot be erected
Winds Sustained > 35 kts	Should not be moved
Winds, Gust > 52 kts	Should not be moved

Table 2.6. Weather Sensitivity on Airframes and Related Programs.

	Non-Conv Winds (kts)		Svr TS	Precipitation					Turbulence		
	TE Warn	High Wind WW	Hail >3/4" High Wind	FZDZ	FZRA	SN 1/2-<6"	SN >6"	RA >2"	LGT	MDT	SVR
UH-1N											
PT Truck				Road	Road	Road	Road	Road			
TE Truck	No Erect			Road	Road	Road	Road	Road			

	CIG		VIS		Icing		
	< 700'	< 500'	< 2sm	< 1sm	LGT	MDT	SVR
UH-1N	Training Missions	All Missions	Training Missions	All Missions			
PT Truck				Road			
TE Truck				Road			
SKS(K9)							

N/A GO MARG NO GO Road= Could impact TCF decisions on road conditions.

2.5. Training, Missions, Operating Areas, and Weather Sensitivities. Pilot/driver discretion is used to determine mission go/no-go regardless of the weather phenomena listed in the MEF or briefed.

2.6. Primary Customer Weather Limitations. The following tables provide primary organizational weather limitations:

Table 2.7. 341 MW Weather Limitations.

Weather Phenomena	Lead Time (min)	Impact	Customer Action
Tornado	15	Personal injury; Equipment damage	Severe Weather Action Procedures (SWAP); All operations take cover
Severe Thunderstorm (Hail ≥ ¾", Winds sustained ≥ 35 kts / Gust ≥ 52 kts)	30	Personal injury; Equipment damage	SWAP; All outdoor operations should be prepared to take cover
Freezing Precipitation	60	Delay or cease operations	SWAP; Yellow/Red road conditions possible; Helicopter grounded
Blizzard	90	Delay or cease operations	SWAP; Yellow/Red road conditions likely
Fresh Snow (≥ ½" but < 6"	90	Flight Hazard; Road hazard	Yellow road conditions likely
Heavy Snow (≥ 6" in 12 hours)	90	Flight Hazard; Road hazard	SWAP; Yellow/Red road conditions likely
Heavy Rain (≥ 2" in 12 hours)	90	Road hazard	Yellow/Red road conditions possible
TE Wind Warning (Wind gusts ≥ 35 kts)	60	TE hazard	TE cannot be erected
High Winds (Winds sustained ≥ 35 kts / Gusts ≥ 52 kts)	60	Road hazard	Yellow road conditions; TE/PT shouldn't be moved
Level I Wind Chill (<0F)	Observed	Personnel hazard	Outdoor activities restricted; cold weather gear essential
Level II Wind Chill (<-40F)	Observed	Personnel hazard	Yellow road conditions
Level III Wind Chill (<-65F)	Observed	Personnel hazard	Red road conditions
Lightning w/in 5NM	Observed	Delay operations	Outdoor fueling activities cease; PT, TE, Crane, ESA Room maintenance sites seek shelter. Helicopters grounded
Lightning w/in 10NM	Observed	Delay operations	WSA and munitions activities cease
Icing (≥ light)	Observed	Flight hazard	Helicopter change route/cancel flights

Turbulence (> Moderate	Observed	Flight hazard	Helicopter change route/cancel flights
Ceiling/Visibility (< 500 ft / <_1 SM)	Observed	Flight hazard	Helicopter change route/cancel flights

2.7. Ground Movement Limitations. Actual road conditions are determined by TCF and wing leadership.

Chapter 3

AIRFIELD OBSERVATION SERVICES

3.1. General. Airfield observation services include those weather related actions that affect the Malmstrom aerodrome (defined within 5SM of the main helipad) or the base as a whole.

3.2. Observations. Malmstrom uses the FMQ-22 running in full automatic mode as its primary source for observations. When augmentation or back-up is needed, it is done in accordance with AFMAN 15-111. Attachment 3 contains examples of the different types of observations.

3.2.1. Official Manual Observing Site. Malmstrom's official observation site is located southeast of building 300.

3.2.2. METAR (Meteorological Aerodrome Report). Routine METAR observations are disseminated every hour 56 minutes after the hour. The observation is automatically generated by JET and is disseminated longline and displayed locally.

3.2.3. SPECI (Special Observation). SPECI observations are taken whenever certain weather events, defined in AFMAN 15-111 and listed in Attachment 4, occur at Malmstrom AFB. This type of observation is also automatically generated by JET and is disseminated longline and displayed locally.

3.2.4. LOCAL (Locally Generated Observation). A LOCAL observation will consist of Altimeter only and be passed verbally to the SOF which is collocated with the observer.

3.3. Basic Weather Watch (BWW). Besides monitoring the FMQ-22's scheduled hourly METAR observations, weather personnel recheck weather conditions at least every 20 minutes when any of the following are observed to be occurring or are forecast to occur within one hour. ***NOTE:*** In addition to the below minimum requirements, weather personnel will remain alert for any other changes in weather conditions that will require a SPECI observation. Weather personnel will also monitor area observation and forecast products as often as necessary to keep abreast of changes expected to affect their area of responsibility.

3.3.1. Ceiling forms below or decreases to less than 1,500 feet.

3.3.2. Ceiling forms below or decreases to less than 1,000 feet.

3.3.3. Visibility decreases to less than 3 miles (4800 meters).

3.3.4. Visibility increases to equal or exceed 3 miles (4800 meters).

3.3.5. Visibility is 1 mile (1600 meters) or less.

3.3.6. Precipitation (any form) is observed.

3.3.7. Thunderstorms are observed.

3.3.8. Fog or mist is present.

3.4. Cooperative Weather Watch (CWW). The CWW is a process for Facility Managers (FMs), ground crews, security forces, maintenance crews, flying unit personnel, and/or anyone else out in the complex or on base to report changes in weather conditions to the on-duty weather forecaster (DSN: 631-2710/2463, COMM: 406-731-2710/2463). CWW inherently dictates close contact between the 341 OSS/OSW and the previously mentioned organizations or personnel,

especially FM personnel. The FMs receive one-on-one training by the 341 OSS/OSW and are a valuable resource out in the missile complex. 341 OSS/OSW leadership will be responsible for ensuring CWW compliance by coordinating training with associated CWW unit leadership. Due to the vastness of the missile complex, there may be significant difference in complex weather and Malmstrom AFB. FMs will notify weather personnel when any of the following are seen or occur at the MAFs:

3.4.1. Dense fog/mist which reduce visibility to less than 1SM.

3.4.2. Hail.

3.4.3. Tornadoes and/or funnel clouds.

3.4.4. Any damage caused by weather.

3.5. Continuous Weather Watch. The FMQ-22 will conduct a Continuous Weather Watch when in fully automatic mode (normal configuration). The FMQ-22 will monitor weather conditions continuously. In addition to taking METARs, the FMQ-22 will take and disseminate observations as conditions occur that meet SPECI observation criteria. Weather flights may perform a Continuous Weather Watch during FMQ-22 augmentation if locally determined to be more appropriate due to existing meteorological conditions.

3.6. METWATCH. METWATCH provides and organized approach for weather personnel to maintain situational awareness of the current/future meteorological situation within designated areas. This process involves notifying supported units and updating any forecast products when pre-established weather conditions or changes not forecasted (timing, location, or forecast values) in weather occur or are expected to occur. All on-site meteorological and commercial data sources (Satellite, Weather Radar, Websites, National Oceanic Atmospheric Administration (NOAA) Weather Radio, etc.) may be used to accomplish this task. The 25 OWS will perform a continuous METWATCH for Malmstrom AFB and the complex. 341 OSS/OSW personnel will act as the "eyes forward" for the 25 OWS by providing immediate feedback on current or short-term anticipated changes in weather conditions. ***NOTE:*** Though similar to MISSIONWATCH (**Chapter 4**, paragraph 4.4), transient missions are not considered "local" though the mission may have originated/terminated at Malmstrom AFB.

3.6.1. EYES FORWARD Process/Procedure. This process/procedure is the 341 OSS/OSW's role in allowing for the integration of weather data, meteorological satellite imagery, lightning detection readouts, and non-standard weather data systems to create an integrated weather picture and near-term forecast for the 25 OWS. The 341 OSS/OSW provides meaningful meteorological information not contained in the coded observations to the 25 OWS as an integral part of our METWATCH process (phone calls, emails, etc). Additionally, the 341 OSS/OSW integrates the current state of the atmosphere in to an understanding of future impacts on forecast conditions and communicates the impacts/information to the 25 OWS, as needed.

3.7. Pilot-to-METRO Service (PMSV) Support. Weather information is available via PMSV during duty hours on frequency 239.8 MHz. During closure hours, PMSV will not be monitored. There will be a minimum of one radio check each day to verify PMSV radio is in full service. For aircraft outside the range of our PMSV system, PMSV support can be obtained through a phone patch to the 341 MW/CP at DSN 632-3801. Commercial 406-731-3801, or to the 25 OWS at DSN 228-6598/6599/6588, Commercial 520-882-6598/6599/6588.

3.7.1. In the event of a PMSV outage, the 341 OSS/OSW will notify the 40 HS, CP, and the 25 OWS.

3.7.1.1. Long Term Outage (over four hours): 341 OSS/OSW members will contact and complete the following:

3.7.1.1.1. 40 HS: Ensure SOF is aware of the extended outage.

3.7.1.1.2. CP: Let them know of the extended outage.

3.7.1.1.3. 25 OWS, DSN 228-7655: Let them know of the extended outage.

3.7.1.1.4. Heliport Management, DSN 632-1589/Commercial 406-731-1589: Place request for PMSV outage in local Safety Notice to Airmen (NOTAM). Prepare/provide the following message: (The decoded message will read: "Frequency 239.8 PMSV not available." See Figure 3.1).

Figure 3.1. NOTAM.

NOTAM
CODE: QXXXX 239.8 PMSV

3.7.1.1.5. Brief aircrews of outage. Provide alternate contact options.

3.7.1.2. Recovery. 341 OSS/OSW members will contact and complete the following:

3.7.1.2.1. Perform a radio check to verify operability and document on PMSV log.

3.7.1.2.2. Notify all affected units when the PMSV equipment is back in operation.

Chapter 4

MISSION EXECUTION FORECAST (MEF) SERVICES

4.1. General. Mission forecast services are those weather related actions directly related to completing each customer's daily mission(s). The MEF is the primary tool used to accomplish these tasks. MEFs are tailored to individual customer requirements and may be anything from a local flight weather briefing to a change-of-command weather forecast. Any event, both flying and non-flying, which will be affected by weather normally requires some sort of MEF.

4.2. Terminal Aerodrome Forecast (TAF). Malmstrom AFB TAFs will be produced and disseminated by the 25 OWS in accordance with AFI 15-128, AFMAN 15-124, and AFMAN 15-129. Forecast specification and amendment criteria are listed in Attachment 5. TAFs cover a 30 hour period and are valid for 8 hours. TAF will apply to the area within a 5SM radius of Malmstrom AFB, and will be issued every 8 hours during the 341 OSS/OSW's duty hours or as mission dictates. The TAF will be amended during flying operations to properly represent the current conditions.

4.3. Mission Execution Forecasts (MEF). MEFs are essentially mission-specific forecasts that are developed using a 12-step process outlined in AFMAN 15-129, and may be provided by a number of methods (verbally, person-to-person, 175-1s, etc.) During this process, the 341 OSS/OSW will fuse and tailor products created by strategic and theater weather centers, as well as information supplied by local units (e.g., flying schedule) and agencies. The end result is a product/information designed to provide timely, accurate, and relevant weather intelligence to various customers by whatever means proves most effective. MEFs must be horizontally consistent with (but not necessarily mirror) products issued by the 25 OWS and the 557th Weather Wing. However, during rapidly changing conditions, emergencies, or when conditions threaten resource protection, the 341 OSS/OSW will amend the MEF to accurately reflect conditions and back-brief the 25 OWS when time permits.

4.3.1. Flying MEF. The 341 OSS/OSW will produce a variety of weather products to support aviation movements throughout the missile complex. Primary products will include the FLIMSY (Forecast for Local or Informational Message) and the Flight Weather Briefs.

4.3.1.1. FLIMSY MEF. MEFs are generated by the 341 OSS/OSW forecaster as needed. The FLIMSY is the primary briefing tool for all wing flying missions. The FLIMSY provides temperature, enroute and flight-level winds, hazards, space weather impacts, current watches, warnings, and advisories, and forecasted destination and alternate weather conditions for the base as well as individual squadrons within the missile complex. MEFs will be issued by crew show time valid for 0800L-1700L, 1700L-0200L, and as needed. However, other alternate briefing forms are available, such as DD Form 175-1 and verbal briefings. The 341 OSS/OSW forecaster will also perform a MISSIONWATCH for mission limiting weather at Malmstrom and the complex.

4.3.1.2. Flight Weather Briefings. Weather personnel will provide traditional Flight Weather Briefings (DD Form 175-1, *Flight Weather Briefing*) to aircrews flying outside of the local flying area. Briefings will be requested as soon as possible to complete the 175-1. Aircrews operating away from home base will schedule flight weather briefings with the appropriate OWS, preferably two or more hours prior to flight time. There is an

internet based aircrew weather briefing system in the operations/flight planning area for transient aircrews to obtain weather data from the appropriate OWS. The 25 OWS can be contacted by phone (DSN 228-6598/6599), fax (DSN 228-7361, or via internet access: (**https://25ows.us.af.mil/WX_BRIEF/index.cfm?bandwidth=H&userFunction=O&aor=2**).

4.3.1.3. In the event that immediate weather support is needed and the 341 OSS/OSW forecaster is not available, aircrews can obtain weather information from the 25 OWS website located at: **https://25ows.us.af.mil/tailored_met/index.cfm?fuseaction=showunit&B_ICAO=KGFA+K012+K341+K564+K490+K010&UNIT_ID=25&BW=H&UF=M&aor=2**. Additionally, the 25 OWS forecaster, responsible for Malmstrom AFB, can be reached at DSN 228-7647 ~~7644~~ for general weather questions.

4.3.2. Ground Support MEFs. The 341 OSS/OSW will produce a variety of weather products to support ground movements throughout the missile complex.

4.3.2.1. Ground Support Slides. The 341 OSS/OSW will produce the Ground Support Slides for the Transportation Control Function (TCF). These are situational awareness products depicting the forecasted conditions for the three missile squadrons.

4.3.2.2. CAT-1 Brief. The 341 OSS/OSW will produce a Pre-Brief Route Forecast for the CAT-1 briefing held the day prior to be briefed in person. The main Route Forecast will be created 2 hrs prior to start time the day of the CAT-1. The 341 OSS/OSW will also verbally brief the Route Forecast in a variety of telecons with the TCF/MSC, convoy commander, and group and wing leadership.

4.3.2.3. Missile Movement Brief. The 341 OSS/OSW will produce a Missile Movement Weather brief to be incorporated in to the main Missile Movement brief given by maintenance and will brief in person. An email will dictate the time and location of the briefing.

4.3.3. Pre-Departure Brief. The 341 OSS/OSW will produce a Pre-Departure brief for the missile crews heading out to the field. This brief includes a satellite slide, radar & current conditions slide, missile squadron slide, wind chill slide (winter), 24 hr Malmstrom forecast slide, and a 5-day outlook slide. These slides will also contain audio narration.

4.3.4. Malmstrom Forecast. The 341 OSS/OSW will produce a Fitness Forecast for the Fitness Assessment Cell (FAC). This slide will contain a nine hour stoplight chart for a variety of weather parameters deemed important by the FAC which can affect fitness testing.

4.4. MISSIONWATCH. This term is used to describe the process by which the 341 OSS/OSW monitors the weather for all local missions, to include all working areas. All on-site meteorological and commercial data sources (satellite, radar, internet sites, etc.) may be used to accomplish this task. It is through this method that MEF amendments/updates are accomplished. During rapidly changing weather, the 341 OSS/OSW will amend/update the MEF as required and contact the appropriate agencies (i.e. 341 MW/CP, TCF, MMOC and/or 40 HS) to pass on critical changes.

Chapter 5

STAFF WEATHER SERVICES

5.1. General. Staff services are those briefings provided primarily by 341 OSS/OSW leadership. These briefings are a specialized type of MEF focused on a particular event/audience. Examples include, but are not limited to, staff meetings, emergency (real world or exercise) meetings, and Instrument Refresher Course briefings.

5.2. Operational Hours. The majority of briefs are provided during normal duty hours (0730-1630L & 2000L-0100L). Contingency, exercise briefings, and other briefing support are provided as needed.

5.3. Wing Stand Up (WSU). WSU weather briefings for 341 MW will be provided on Wednesdays at 0900L in the Wing Conference Room. Standard information includes a satellite picture, radar, Malmstrom forecast, 5-day weather outlook and other AFGSC base's 24hr forecasts. On the first Wednesday of the month, local climatology slides (past month stats, current month's climatology, thunderstorms and/or snow) will be included and briefed.

5.4. Quicklook (QL). QL weather briefings will be provided for wing leadership M-F by 1400L in PowerPoint format. In-person briefs will be handled by request. Standard information includes the Complex Forecast and the 5-day weather outlook.

5.5. Inspector General (IG) In-Briefs. IG in-briefs for 341 MW will be provided as required. Standard information includes a satellite picture, radar, Malmstrom Forecast and the 5-day weather outlook. More or less information can be provided as requested.

5.6. Crisis Action Team (CAT) Briefings. The 341 OSS/OSW will provide weather briefings as required for CAT meetings. This includes but is not limited to real-world events, exercise, and deployment briefings. Each briefing will be tailored to provide the appropriate weather intelligence required by wing leadership. Briefings will be in PowerPoint format and briefed in-person as notified.

5.7. Emergency Operations Center (EOC) Briefings. The 341 OSS/OSW will provide weather briefings as required for EOC meetings. This includes but is not limited to real-world events, exercise, and deployment briefings. Each briefing will be tailored to provide the appropriate weather intelligence required by wing leadership. Briefings will be in PowerPoint format and briefed in-person as requested.

5.8. Instrument Refresher Course (IRC) Briefings. The 341 OSS/OSW provides IRC briefings as requested by the 40 HS in accordance with AFMAN 11-210, *Instrument Refresher Course (IRC) Program*, and AFMAN 15-129. The weather portion of the briefing consists of an overview of the 341 OSS/OSW's Airfield and Mission Services, 341 OSS/OSW capabilities, 341 OSS/OSW and 25 OWS responsibilities, resource protection, seasonal/regional weather, and space weather impacts (when applicable).

5.9. Flight Information Publication (FLIP) Weather Updates. The 341 OSS/OSW is responsible for ensuring all weather information in the FLIP is accurate. The FLIP is checked for accuracy on a quarterly basis.

Chapter 6

SPACE WEATHER SUPPORT AND SERVICES

6.1. General. Many of our weapons and communications systems use satellites and radio waves (High Frequency (HF), Very High Frequency (VHF), Ultra High Frequency (UHF), and Satellite Communications (SATCOM)), that can be rendered useless by electro-magnetic radiation from the sun. This chapter contains some brief information regarding space weather limitations, alerts and warnings, and products available to Malmstrom personnel.

6.2. Limitations. Like terrestrial weather, there are numerous factors that influence space weather. One of the biggest limitations we have in identifying and forecasting space weather is a lack of sensors. Additionally, given the speed of light and solar wind, our ability to provide lead-times for significant space events is extremely limited.

6.3. Space Weather Alerts and Warnings. Malmstrom's missions have a wide variety of parameters possibly affected by various space weather conditions (HF and UHF communication, radar, Global Positioning System (GPS) Com, etc.).

6.4. Products. Numerous space weather products are available from Air Force Weather Web Services (AFW-WEBS). Most space weather products from the strategic center are "now-casts" and/or very short-term forecasts (6-hourly period), so the duty forecaster will check websites for updated products when a new TAF is issued and update the MEF accordingly.

6.4.1. GPS Products. GPS products are primarily "now-casts" and/or <1 hourly forecast. Due to the frequent refresh rate required for monitoring these products, the MEF provides a web link. Duty forecasters will only need to monitor these products when specifically requested by the customer.

Chapter 7

SPECIAL MISSION REQUIREMENTS

7.1. General. This chapter contains all of the unique local requirements submitted by various organizations throughout the Malmstrom AFB and verified by the 341 OSS/OSW leadership. The requirements will be reviewed annually by the requesting unit and updated as required.

7.2. 341st Public Affairs (341 MW/PA) will coordinate tours of the base weather station by community groups and other with the 341 OSS/OSW leadership.

7.3. 341st Command Post (341 MW/CP) will ensure dissemination of weather warnings and advisories as outlined in Chapter 9 of this instruction.

7.3.1. Notify the 341 OSS/OSW forecaster on duty immediately of all aircraft/ground emergencies, incidents, or accidents via phone and/or crash-net.

7.3.2. Notify the 341 OSS/OSW of any outages with their JET that they encounter.

7.3.3. Run applicable checklist to notify wing leadership and various base agencies of severe weather when notified by the 341 OSS/OSW or 25 OWS.

7.4. 341st Wing Safety (341 MW/SE) may request any and all weather information pertaining to a mishap. Once requested, the mission service forecaster will provide the information to 341 MW/SE, Safety Investigation Board and/or wing leadership as soon as possible.

7.5. 341st Communications Squadron (341 CS) will maintain the PMSV radio and ensure that scheduled maintenance does not degrade the MISSIONWATCH and/or METWATCH performed by the 341 OSS/OSW during periods of inclement weather, and notify the 341 OSS/OSW duty forecaster prior to starting any routine maintenance.

7.6. 341st Civil Engineer Squadron, Readiness Flight (341 CES/CEX) will contact the 341 OSS/OSW for pertinent weather information as required.

7.6.1. The 341 OSS/OSW will provide weather data (observations and forecasts) to 341 CES/CEX running Nuclear, Biological, and Chemical (NBC) dispersion models for NBC consequence assessments and toxic corridor.

7.6.2. The 341 OSS/OSW will provide Effective Downwind Message (EDM) and Chemical Downwind Messages (CDM) as requested.

7.7. 341st Maintenance Group (341 MXG) will contact the 341 OSS/OSW for pertinent weather information as requested.

7.8. 341st Security Forces Squadron (341 SFS) will promptly inform the 341 OSS/OSW of any hazardous weather reported by Security Forces personnel (tornado, hail, blizzard, etc.).

7.9. Facility Managers (FMs). The 341 OSS/OSW will provide a weather operations orientation briefing to all new FMs to aid in identifying severe and/or adverse weather.

Chapter 8

RESOURCES PROTECTION SERVICES

8.1. General. This chapter contains details on weather watches, warnings, and advisories. Resource protection is accomplished through a joint effort between the 25 OWS and the Malmstrom 341 OSS/OSW. The 25 OWS is responsible for issuing all forecasted weather watches and warnings. The 341 OSS/OSW acts as the 'eyes forward" for the 25 OWS, and is responsible for issuing all observed warnings and advisories. However, the 341 OSS/OSW can issue any forecasted warning if there is an immediate threat to life and/or property. In these cases, the 341 OSS/OSW will back brief the 25 OWS when time permits and will also be responsible for dissemination to local supported agencies. Conversely, the 341 OSS/OSW will act as the alternate dissemination/notification source for the 25 OWS. The goal is to provide the best possible resource protection to Malmstrom AFB and the missile complex.

8.2. Weather Watches. A Weather Watch is a special notice sent to customers indicating that conditions are favorable for the development of a particular type of weather phenomena (e.g., tornadoes, hail, etc.). Watches are issued for a 5 NM radius of the center-point of the main helipad as well as for any location within the 341 MW complex. Tables 8.1 contain all of the Watches and desired lead-times (DLT) issued for Malmstrom AFB and the missile complex.

Table 8.1. Weather Watches for Malmstrom AFB & 341st Missile Complex

Criteria	DLT (minutes)
Blizzard (Conditions lasting ≥ 3 hours, winds (sustain/gust) ≥ 30KTS, visibility ≤ 1/4 SM in snow/blowing snow)	As Potential Warrants
Freezing Precipitation	As Potential Warrants
Severe Thunderstorms (Potential for Hail ≥ ¾ IN and/or Sustained Winds ≥ 35KTS and/or Gusts ≥ 52KTS)	As Potential Warrants
Heavy Rain (≥ 2 inches in 12 hours)	As Potential Warrants
Heavy Snow (snowfall accumulation ≥ 6 inches in 12 hours)	As Potential Warrants
Wind Conditions (Sustained Winds ≥ 35KTS and/or Gusts ≥ 52KTS)	As Potential Warrants
Lightning within 5 NM	30
Tornado	As Potential Warrants

8.3. Weather Warnings. Weather warnings are special notices sent out to customers alerting them that a predefined weather event which will pose a threat to life or property and is expected to occur. Warnings are issued for a 5 NM radius of the center-point of the Malmstrom heliport as well as for any location within the 341 MW complex. Forecasted warnings, with their desired lead-times, are contained in Table 8.2.

Table 8.2. Weather Warnings for Malmstrom AFB & 341st Missile Complex.

Criteria	DLT (minutes)
Zilch (IWWC Test)	0
Wind Conditions (TE Wind Gusts ≥ 35KTS) See **Note 1**	60
Blizzard Conditions (Forecast conditions lasting ≥ 3 hours, winds sustained/gust ≥ 30 KTS, visibility ≤ 1/4 SM in snow/blowing snow)	90

Freezing Precipitation	60
Heavy Rain (≥ 2 inches in 12 hours)	90
Heavy Snow (Forecasted snowfall ≥ 6 inches in 12 hours)	90
Severe Thunderstorms (Forecasted Hail ≥ ¾ inch and/or Sustained Winds ≥ 35KTS and/or Gusts ≥ 52KTS)	30
High Winds (Sustained Winds ≥ 35KTS and/or Gusts ≥ 52KTS)	60
Tornado	15

Note 1: Issued only by the EU during duty hours for TE operations

8.4. Observed Weather Warnings. In accordance with AFI 91-203, *Air Force Consolidated Occupational Safety Instruction*, lightning warnings are the only type of observed warning issued on Malmstrom AFB or the missile complex. Lightning warnings are not issued until lightning is observed, either visually, audibly or via National Lightning Detection Network. The lightning warning will remain valid until lightning has not occurred in the area for 15 minutes. The 341 OSS/OSW will provide timely notification to all supported units upon issuance and expiration of a lightning warning. Observed weather warnings are contained in Table 8.3 & 8.4.

Table 8.3. Observed Warnings for Malmstrom AFB.

Criteria
Lightning within 5 NM
Lightning within 10 NM (phone call to Weapon Storage Area (WSA) during normal duty hours DSN: 632-6852)

Table 8.4. Observed Warnings for the 341st Missile Complex.

Criteria
Lightning within the Complex (issued only for active PT, TE and Crane sites as well as ESA Room Maintenance)

8.5. Forecast Weather Advisories. A forecasted weather advisory is a special notice sent to customers alerting them that a predefined weather phenomenon which may impact operations is forecast to occur on Malmstrom AFB or the missile complex. Forecast weather advisories are located in Table 8.5.

Table 8.5. Forecast Weather Advisories for Malmstrom AFB & 341st Missile Complex.

Criteria	DLT (Minutes)
Snow Advisory (fresh snowfall ≥ 1/2 inches but < 6 inches)	90

8.6. Observed Weather Advisories. An observed weather advisory is a special notice sent to customers alerting them that a predefined weather phenomenon which may impact operations is currently occurring on Malmstrom AFB as well as for any locations within the 341 MW complex. Observed weather advisories are located in Table 8.6 & 8.7.

Table 8.6. Observed Weather Advisories for Malmstrom AFB.

Criteria
Turbulence Advisory (> Moderate)

Icing Advisory (≥ Light)
Ceiling/Visibility (Ceiling < 500FT and/or Visibility < 1SM)
Level I wind chill temperature < 0°F
Level II wind chill temperature <-40°F
Level III wind chill temperature <-65°F

Table 8.7. Observed Weather Advisories for the 341st Missile Complex.

Criteria
Turbulence Advisory (> Moderate)
Icing Advisory (≥ Light)
Ceiling/Visibility (Ceiling < 500FT and/or Visibility < 1SM)
Level II wind chill temperature <-40°F
Level III wind chill temperature <-65°F

8.7. Format. Advisories, watches, and warnings will be numbered consecutively by identifying the type of weather message (watch, warning, or advisory) followed by a five-digit number. The first two numbers indicate the current month while the second three numbers indicate the sequence number. For example, the message "Weather Warning 02-005" means the month is February (02), and this is the fifth (005) warning issued in the month. The message "Weather Advisory 12-013" means the month is December (12) and this is the thirteenth (013) advisory issued in the month. Examples of different messages are contained in Attachment 3. *NOTE:* In the event that JET is inoperable, the AF Form 3806 and/or AF Form 3807 will be filled out by the duty forecaster.

8.8. Upgrades/Downgrades. Advisories and warnings will be upgraded (i.e., winds increase from 35 knots to 50 knots) or downgraded as required. Upgrades should meet the desired lead times specified above. Only one forecasted warning may be in effect at one time. If a warning is issued for one criteria and it becomes necessary to warn for another criteria, a new warning, with a new number, will be issued to include all criteria expected. A separate valid time may be specified for each criterion, if necessary.

8.9. Amendments. Amendments to weather warnings and watches will only be issued to change the valid time and will be issued before the original watch or warning expires. New warnings and watches will be issued for any change in weather criteria.

8.10. Cancellation. Warnings and watches may be cancelled when the weather phenomena are no longer occurring or expected to occur. However, if not canceled, they will expire at the end of the valid period. Observed advisories will be canceled when the criteria are no longer occurring and is not expected to occur again in the next hour. See paragraph 8.4 for cancellation of observed lightning warnings.

8.11. Severe Weather Action Procedures (SWAP). SWAP is in place to ensure sufficient personnel are available during potential/actual severe weather events or during meteorological/operational events critical to mission success. For the purpose of these procedures, severe weather is defined as any weather phenomenon considered critical enough by the customer to require advance/special notice and subsequent actions to prevent serious injury or damage to personnel, property, or resources. It is imperative that timely and accurate weather watches, warnings, and advisories are disseminated to all Malmstrom AFB agencies to ensure

personnel and resource protection. These procedures document a two-tier system with the 341 OSS/OSW and the 25 OWS sharing responsibilities for SWAP and resource protection.

8.11.1. 341 OSS/OSW Responsibilities. The 341 OSS/OSW will perform the SWAP responsibilities as defined in AFMAN 15-129, AFI 10-229, and AFI 10-206. More specifically, 341 OSS/OSW will accomplish the following procedures for notification:

8.11.1.1. During normal staff duty hours (0730 to 1630 MT, Monday through Friday, except federal holidays/authorized down days), the duty forecaster will implement SWAP whenever one or more conditions in Table 8.8 are met. It is likely the above personnel will be present in the weather station and do not need to be recalled.

8.11.1.2. Standby/Recall Procedures. During nights, weekends, and federal holidays/authorized down days, the duty forecaster at the 25 OWS will implement SWAP by notifying the Command Post by phone whenever one or more conditions in Table 8.8 are met to determine if the SWAP needs to be activated. Command Post will notify the on-call 341 OSS/OSW person.

8.11.1.3. Activation. The duty forecaster will discuss the meteorological situation with the 25 OWS, manning requirements, and the recall of additional personnel (or place on standby) with the SWAP member. (If a SWAP member is unavailable, coordinate with the 341 OSS/OSW Flight/CC, or 341 OSS/OSW NCOIC.) If deemed necessary, the SWAP member will report to the weather station as soon as possible after notification by the duty forecaster. Once the SWAP member has arrived, they will assist in evaluating the situation, determine the need to recall additional personnel, and execute the SWAP duties/responsibilities in Table 8.8.

8.11.1.4. Upon arrival at the weather station, the SWAP standby member, time permitting, will conduct a meteorological teleconference (METCON) with the 25 OWS Forecaster/Shift Supervisor.

8.11.1.5. Weather personnel will augment the FMQ-22 if needed.

Table 8.8. Conditions Requiring SWAP.

Criteria
Blizzard (Base Only)
Freezing Precipitation (Base Only)
Severe Thunderstorms (Base Only)
Heavy Snow (Base Only)
Tornado
Heavy Rain (Base Only)

Table 8.9. SWAP Duties/Responsibilities.

Order of Priority	Duty Forecaster
1	Notify/recall SWAP Member and 341 OSS/OSW leadership
2	Coordinate with the 25 OWS on the issuance of Watches/Warnings
3	Eyes Forward – Intensify monitoring of local and area weather conditions to enhance

	METWATCH and MISSIONWATCH
4	Notify appropriate agencies of the issuance of Watches/Warnings
5	Review SWAP checklist and begin any duties, as necessary, until the SWAP member arrives
6	Conduct a concise forecast discussion of the current situation to apprise SWAP member upon their arrival
7	Augment observations (if needed) in accordance with METAR, SPECI, and LOCAL criteria; AFMAN 15-111; and Standard Operating Procedures
8	Issue observed Warnings/Advisories
9	Review PIREPs, Significant Meteorological events (SIGMETs), and area National Weather Service (NWS) forecasts products for severe weather reports. If applicable, notify the 25 OWS and incorporate data into products.
10	Update Mission Execution Forecasts (MEFs) as needed
11	Provide inputs to post-event OPREP-3 report (if required). Archive data for and perform forecast review (if needed).
Order of Priority	**SWAP Member**
1	Report to weather station within 30 minutes of initial notification. Determine if the situation warrants the recall of additional personnel
2	Upon arrival, receive initial forecast discussion from Duty Forecaster
3	Assume tasks delegated by the Duty Forecaster

8.11.2. 25 OWS Responsibilities. 25 OWS will immediately notify the 341 OSS/OSW duty forecaster when any watches or warnings listed in Table 8.8 are issued. 25 OWS and the 341 OSS/OSW will implement their SWAP IAW local guidance. If there is no answer at the primary number, 25 OWS will make a backup call to the 341 MW/CP and alert them to the severe weather threat. As soon as 25 OWS finishes contacting the primary or alternate POC, it will implement internal SWAP. Although most SWAP criteria are issued by 25 OWS, the 341 OSS/OSW could issue a SWAP criteria warning, at which time, it will notify 25 OWS and both will start coordinated SWAP. 25 OWS will accomplish the following procedures when severe weather is determined likely:

8.11.2.1. 25 OWS Internal SWAP. 25 OWS internal SWAP includes: increased vigilance by forecasters and supervisors; increased communications with supported units as necessary; and reallocation of internal resources and actions, as necessary.

8.11.2.2. Intensify METWATCH.

8.11.2.3. Review watch/warning criteria for Malmstrom AFB, collaborate with 341 OSS/OSW and issue products as required.

8.11.2.4. If the 25 OWS is acting as the 341 OSS/OSW, they will provide data to the Command Post (341 MW/CP) for OPREP reporting purposes as outlined below in paragraph. 8.11.7.

8.11.3. Post Event Procedures. If severe weather actually occurs, accomplish the following:

8.11.3.1. Notify 25 OWS flight leadership (if not already present).

8.11.3.2. Examples include reports from local law enforcement and emergency management agencies, local news media, and supported weather flights.

8.11.3.3. The 25 OWS SWAP leader will perform a "data save" and provide all pertinent information to the 341 OSS/OSW leadership. The flight leadership will compile the information and provide a summary to the 25 OWS and AFGSC/A3W for further dissemination at their discretion.

8.11.4. Severe Weather Damage Reporting/OPREPs. In the event of severe weather, in accordance with AFMAN 15-129, AFI 10-229, and AFI 10-206, the 341 OSS/OSW will query the NWS, local spotters, and online damage assessment data sources to collect the area impacts of severe weather (on base or in the missile complex) as time permits. Following a severe weather event in which Hail $\geq$ 3/4 inch, Tornado, Heavy Snow, Freezing Precipitation and/or Blizzard occur, the 341 OSS/OSW will provide 341 MW/CP with the following information required for inclusion in an OPREP-3 report produced by 341 MW/CC.

8.11.4.1. Actual severe weather experienced, along with any other pertinent information (damage reports, visual/radar tornadic confirmations, etc.).

8.11.4.2. TAF valid at the time of occurrence.

8.11.4.3. Any watches, warnings, and/or advisories issued to include actual and desired lead time.

8.11.4.4. Operational status of meteorological and communication equipment.

8.11.4.5. The Command Post, in turn, will provide the 341 OSS/OSW with a copy of any weather related OPREPs. The 341 OSS/OSW will provide damage reports and OPREP-3s to the 25 OWS and higher headquarters as soon as possible. *NOTE:* 341 MW/CC is the releasing authority for OPREP-3s.

8.11.4.6. The 341 OSS/OSW will notify and provide 25 OWS and AFGSC/A3BW of any OPREP-3 and severe weather reports immediately after fulfilling any local distribution requirement for post-analysis and verification. Request 25 OWS to provide required information, if needed, by performing a weather data save.

8.12. Chemical Downwind Messages (CDM)/Effective Downwind Messages (EDM). The 341 OSS/OSW is the primary unit for providing CDM/EDM support. CDM bulletins can be produced in station but are also available on the 25 OWS website. They are used to determine the spread of chemical and biological agents that are released at the surface (CDM) as from a fuel leak and aloft (EDM) as from a nuclear detonation.

Chapter 9

WEATHER INFORMATION DISSEMINATION

9.1. General. This chapter describes the weather dissemination systems, dissemination procedures, and back-up systems and procedures. Timely and effective dissemination of weather Watches Warnings and Advisories is crucial to the success of the wing mission and resource protection. AFI 10-229 restricts the 341 OSS/OSW from directly notifying via telephone more than 3 organizations in order to focus on incoming weather phenomena. Most organizations will receive this information via the Joint Environmental Toolkit while some organizations will receive courtesy calls.

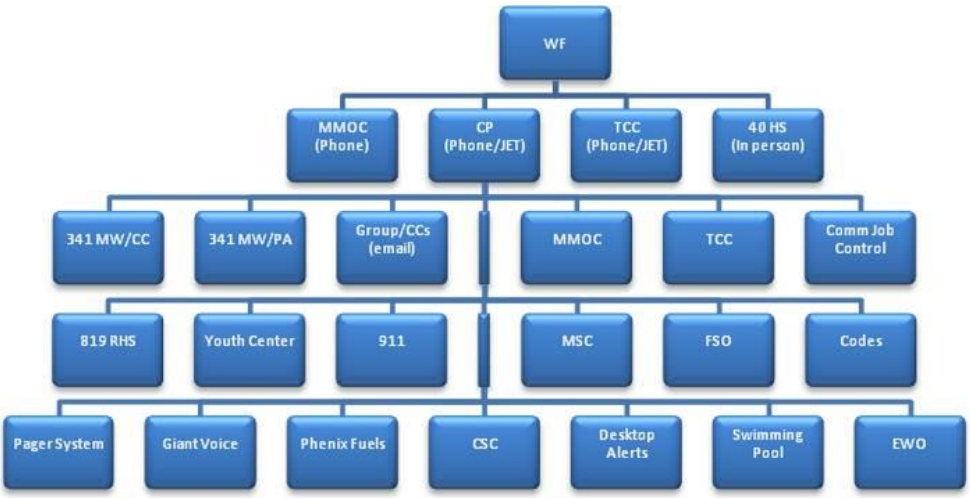
9.2. Dissemination and Back-up Systems. Currently the 341 OSS/OSW uses the Joint Environmental Toolkit (JET) as its primary method of disseminating observations, forecasts, warnings, watches, and advisories (WWA). The JET consists of a dedicated computer server in the Network Control Center connected through the base local area network (LAN). The CP, TCF, and MMOC have user accounts to access the JET webpage. Agencies currently without JET passwords will receive critical weather information through the wings dissemination system (CP notifications, CP email, pop-ups, etc.). The 341 OSS/OSW will follow documented backup dissemination procedures documented in the SOPs in the event that JET becomes inoperative.

9.3. Dissemination and Back-Up Procedures. Observations will be taken only when augmentation is needed (hail, tornado, funnel cloud, volcanic ash and items deemed necessary for flight safety) and disseminated through the FMQ-22 as described in Chapter 3. When the FMQ-22 is out of service, observations will be disseminated long-line through JET. If all long-line transmission resources are out of service then Observations will be submitted via telephone to the 25 OWS. Locally, observations will be relayed by the 341 OSS/OSW to the 40 HS via in person or telephone.

9.3.1. Weather Watches, Warnings, and Advisories (WWA). WWAs will be disseminated via JET (see paragraph 9.2 for a list of the organizations) When WWAs are issued, 341 OSS/OSW will give a courtesy call to the MMOC and MSC during CAT missions and call SOF during normal operations. If JET is out of service, the 341 OSS/OSW will contact the same organizations or the 25th will contact the same organizations during hours of closure of the 341 OSS/OSW.

9.4. Base Warning Notification Pyramid Structure Diagrams. The following diagram shows how weather watches/warnings are sent through the wing.

Figure 9.1. Base Warning Notification Pyramid Structure Diagram



Note: The CP does not notify all of the above for every situation

Chapter 10

WEATHER EQUIPMENT

10.1. General. This chapter provides a brief description of the meteorological and communications equipment used by the 341 OSS/OSW. Additionally, it provides information on back-up systems, maintenance, and restoring priorities.

10.2. Meteorological Equipment. The 341 OSS/OSW uses a wide range of equipment to determine the current state of the atmosphere. These critical systems are used continuously to provide customers the most timely, accurate and relevant weather intelligence possible.

10.2.1. FMQ-22. The FMQ-22 is an integrated weather system consisting of multiple weather sensors and information technology components that continually measure/derive wind speed and direction, temperature, dew point, humidity, visibility, barometric pressure, altimeter, sea level pressure, cloud heights & coverage, pressure altitude, density altitude, freezing precipitation and liquid precipitation and liquid precipitation amounts. However, it cannot accurately measure sector visibility, sky conditions throughout the horizon circle, accumulated snowfall, hail, and when a tornado is occurring. It automatically generates surface aviation weather observations based on user-defined events, either by time or occurrence of a particular weather element or category. The FMQ-22 runs in full automatic mode and is the primary source of Malmstrom AFB's official observation. The backup for the FMQ-22 consists of the Kestrel 4000, TMQ-53 and manual observation. The FMQ-22 is also installed at all 15 MAF locations.

10.2.2. Next Generation Radar (NEXRAD). Also known as the Weather Surveillance Radar, 1998, Doppler (WSR-88d), the NEXRAD is a Doppler radar weather system which provides precipitation and wind information. The 341 OSS/OSW uses the GR2Analyst and GR3Analyst radar software which encodes the NEXRAD data. This software is also able to display any NWS radar in CONUS. We primarily use the KTFX radar, which is linked to the Great Falls National Weather Service's (NWS) radar, or the KBLX radar, which is linked to the Billings NWS.

10.2.3. Lightning Tracking Software (LTS2005). The LTS2005 displays real-time lightning, both cloud-to-ground and most intra-cloud discharges, anywhere in the continental US (CONUS), including MAFB and the Missile Complex. It also has adjustable alert areas that can be tailored to the mission. The internet, such as AFW-WEBS, provides the 341 OSS/OSW backup lightning data although it is not real-time as it is time lagged by about 10-20 minutes.

10.3. Communications Equipment. JET. This is our primary system for disseminating forecasts, observations, warnings, watches, and advisories.

10.3.1. PMSV Radio. The Pilot-To-Metro-Service Radio (239.8 MHz) allows the 341 OSS/OSW to communicate with aircrews, both on the ground and flying. If the PMSV is out of service, aircrews can contact the 25 OWS via phone patch (where possible) to get weather data.

10.3.2. Phones/Hotlines. The 341 OSS/OSW has a secondary crash-net phone used by the CP for passing along critical, time-sensitive information rapidly.

10.3.3. Local Area Network (LAN). The 341 OSS/OSW relies heavily on the LAN to improve the timeliness and accuracy of weather intelligence to our customers. The 341 OSS/OSW's ability to support the wing would be severely degraded if the base network were to go down.

10.4. Maintenance. The organizations in Table 10.1 provide preventive maintenance and repair for the weather equipment.

Table 10.1. Maintenance Providers.

Equipment	Provider
PMSV	Comm Focal Point, DSN: 632-2622, COMM: 406-731-2622 / 781-0557
FMQ-22	Fielded Systems Support: 271 2586 / Jet SCA Server Outage x3636 / x2771, AAI (Contractor)

10.5. Restoring Priorities. Priorities for restoring critical systems have been established in the event natural disasters or any other anomaly simultaneously impact systems base-wide. The priorities for weather equipment are listed in Table 10.2 (priorities may be adjusted based on incoming weather).

Table 10.2. Weather Equipment Restoral Priorities.

Equipment / Communications	Restoral Priority
Base Weather UHF Radio (239.8 MHz) - PMSV	Outage-2 Impairment-3
FMQ-22	Remote login fix-3 Site visit required – Schedule for repair
Restoral Priority	**Normal Response Times**
1	0-1 hr
2	ASAP $\leq$ 24 hr
3	Next Duty Day
4	1-3 Duty Days
5	4-8 Duty Days

10.6. Building Power. Building 300 is not equipped with a back-up generator. In the event that a power-outage occurs, the 341 OSS/OSW will go to the alternate operating location site and resume normal duties.

Chapter 11

OWS/WEATHER FLIGHT BACK UP SUPPORT

11.1. General. This chapter briefly describes how weather services will be provided should any such events requiring backup procedures.

11.2. 25 OWS. When weather operations at 25 OWS are interrupted (e.g., power outage, natural disaster, etc.), associated TAF, weather watch, warning and advisory responsibility will be transferred to 341 OSS/OSW until such time the 25 OWS is postured to resume operations. Other 25 OWS weather information responsibilities (e.g., graphical products) will be transferred to other agencies as necessary to continue to keep weather information available to Malmstrom AFB.

11.3. 341 OSS/OSW. For standard station evacuations, support will resume from the alternate operating location site. For longer interruptions, the 341 OSS/OSW will coordinate required support with other organizations. The 25 OWS will not normally produce and disseminate tactical-level weather products for Malmstrom AFB mission execution. The 341 OSS/OSW will coordinate the transfer of this responsibility in advance with 25 OWS.

Chapter 12

RECIPROCAL SUPPORT

12.1. General. This chapter describes support required by the 341 OSS/OSW in order to accomplish its daily mission. Per AFMAN 15-129, support to the 341 OSS/OSW by other local agencies that are mandated by USAF or other local directives are not included in this chapter.

12.2. 341st Command Post (341 MW/CP) will notify the 341 OSS/OSW with sufficient lead time of any wing events or incidents such as alerts or recalls that may involve or require weather support. *NOTE:* Information on briefing format is usually needed. Preparation time varies based on required format.

12.2.1. Utilize the JET software for prompt notification of weather watches, warnings, and advisories.

12.2.2. Disseminate weather watches, warnings, and advisories according to local procedures.

12.2.3. Notify senior wing leadership when any severe weather watch (e.g., tornado, $\geq$ 3/4 inch hail, blizzard, heavy snow, freezing precip), is issued.

12.2.4. Notify the 341 OSS/OSW when any local agency reports a funnel cloud, tornado, large hail (3/4" or greater) or any other significant weather event.

12.2.5. Notify the 341 OSS/OSW of any significant weather related event (material damage, injuries, etc.).

12.2.6. Include the 341 OSS/OSW on their dissemination/notification list for any weather related OPREP-3s or incident.

12.2.7. Initiate SWAP by contacting the 341 OSS/OSW standby forecaster for any Severe Watch or Warning issued for the base outside of the wing's normal duty hours that is listed in **Table 8.8**

12.3. 40th Helicopter Squadron (40 HS) will provide 341 OSS/OSW with timely notification of changes to schedule operations that affect weather support requirements.

12.3.1. Notify the 341 OSS/OSW of required additional support as soon as it becomes known to include monitoring of alternate observations/forecasts and tracking of weather conditions that may affect local flying operations.

12.3.2. Coordinate and provide time during flying safety meetings for weather presentations selected subjects.

12.3.3. Provide the 341 OSS/OSW with access to a weekly flying schedule via PEX and notify of any additional weather support requirements or flying requirements over and above the daily flying schedule. In addition, as a minimum, the schedules must include take-off and landing times and the location/time of in-flight operations.

12.3.4. Provide a pilot report (PIREP) of any significant or unexpected weather encountered in flight via PMSV and/or debrief to the 341 OSS/OSW.

12.3.5. Provide the 341 OSS/OSW feedback via the provided feedback form and/or verbally post flight.

12.4. 341st Communications Squadron (341 CS) will maintain the PMSV radio and troubleshoot FMQ-22 communications IAW the FMQ-22 Service Level Agreement.

12.4.1. Coordinate with off-base agencies to repair off-base lines.

12.4.2. Ensure weather data and telephone circuits are assigned repair priorities.

12.4.3. Ensure that established maintenance response times are met.

12.4.4. Expedite the transfer of communications and access to the base LAN in the event of evacuation to the alternate operating location.

JOHN T. WILCOX II, Colonel, USAF
Commander

Attachment 1

GLOSSARY OF REFERENCES AND SUPPORTNG INFORMATION

Prescribed Forms

None

Adopted Forms

DD Form 175-1, *Flight Weather Briefings*
AF Form 847, *Recommendation for Change of Publication*
AF Form 3806, *Weather Watch Advisory Log*
AF Form 3807, *Watch/Warning Notification and Variation*

Abbreviations and Acronyms

557TH —Weather Wind Headquarters (Offutt AFB, NE)

AIREP —Air Report

AFI —Air Force Instruction

AFMAN —Air Force Manual

AFW —Air Force Weather

AFW—WEBS – Air Force Weather Web Services

AGL —Above Ground Level

AOL —Alternate Operating Location

AOR —Area of Responsibility

°C —Degrees Celsius

CAT —Crisis Action Team

CAT—I – Category 1 Mission / Nuclear Convoy

Cig —Ceiling

CMEF —Controlling Mission Execution Forecast

CONUS —Continental United States

DLT— Desired Lead Time

DSN —Defense Switched Network

EOC —Emergency Operations Center

EWO —Emergency War Order

°F —Degrees Fahrenheit

FMQ—22 – Fixed Meteorological Equipment version 22

Ft —Feet

Kt(s) —Knot(s) / Nautical miles per hour

FLIP —Flight Information Publication

GPS —Global Positioning System

HF —High Frequency

Hg —Atomic Symbol for Mercury

HS —Helicopter Squadron

ICAO —International Civil Aviation Organization

IFR —Instrument Flight Rules

JET –—Joint Environmental Toolkit

LLWS —Low Level Wind Shear

LOCAL —Local Meteorological Observation

LTS2005 —Lightning Tracking Software 2005

MAF —Missile Alert Facility

MDT —Moderate

MEF —Missile Execution Forecast

METAR —Meteorological Aerodrome Report

METWATCH —Meteorological Watch

MISSIONWATCH —Mission Watch

MMOC —Missile Maintenance Operations Center

MOS —Maintenance Operations Squadron

MSC —Missile Security Center

MW –—Missile Wing

MHz —Megahertz

MSL — Mean Sea Level

NEXRAD —Next Generation Weather Radar

NM —Nautical Mile

NOTAM —Notice to Airman

NWS —National Weather Service

OI —Operating Instruction

OPR —Office of Primary Responsibility

OPREP —Operational Report

OPUP —Open Principal User Processor

OSW —Operation Support, Weather

OWS —Operational Weather Squadron

PIREP —Pilot Report

PMSV – Pilot-to—Metro Service

RAWS —Remote Automated Weather System

SATCOM —Satellite Communication

SCC —Security Control Center

SM —Statute Mile

SOF —–Supervisor of Flying

SOP —–Standard Operating Procedures

SPECI —Special Meteorological Observation

SWAP —Severe Weather Action Procedures

TAF —Terminal Aerodrome Forecast

TCC —Transportation Control Center

TEMPO —Temporary Conditions

UHF —Ultra High Frequency

UUA —Urgent Upper Air report (Form of PIREP)

WWA —Watch, Warning and Advisory

VHF —Very High Frequency

VFR —Visual Flight Rules

Terms

Ceiling — the height of the lowest broken (mostly cloudy) or overcast (cloudy) layer, when combined with coverage below it.

Celsius —a Metric unit used to measure temperature in which water freezes at 0° and boils at 100° under standard conditions.

Cooperative Weather Watch — Cooperation between the 341 OSS/OSW, 40 HS, MMOC, FM's and personnel deployed in the missile field to ensure critical weather data is passed to the weather agencies.

Desired Lead-time — the amount of advance notice a supported agency needs to react to an advisory or warning.

Eyes Forward — Refers to 341 OSS/OSW's responsibility to provide real-time weather observations to the 25 OWS (The 341 OSS/OSW will act as the "eyes forward" for providing the 25 OWS with conditions at Malmstrom AFB.)

Fahrenheit — an English Standard unit used to measure temperature in which water freezes at 32° and boils at 212° under standard conditions.

Flimsy — Slang term for a weather brief. Originally it was known as Forecast for Local or Informational Message (FLIMse).

Forecast Weather Advisory — An advisory issued when critical weather conditions are forecast to occur. It's accompanied by a valid time and a desired lead-time.

Knot — is a unit of speed equal to one nautical mile (1.852 km) per hour, approximately 1.151 mph.

METWATCH (Meteorological Watch) — The process of the 25 OWS and the 341 OSS/OSW monitoring Montana's weather. The purpose is to identify when and where observed conditions are different from forecast conditions so the forecast product can be amended and designated agencies notified.

MISSIONWATCH (Mission Watch) — The process of the 341 OSS/OSW monitoring the weather for a specific mission. The purpose is to identify and alert 341 MW customers to changes in the Mission Execution Forecast or provide a new MEF because of changes to the mission itself.

Observed Weather Advisory — an advisory issued when critical weather conditions are observed to occur. No valid times or desired lead times accompany this advisory.

Pilot—to-Metro Service (PMSV) - a two-way radio service used for exchange of weather information between the Weather Flight and aircraft.

Statute Mile (SM) — a standard mile equaling 5280 feet.

Severe Thunderstorm — a thunderstorm with 52 knot winds or greater and/or ¾ inch hail, or greater and/or tornadoes.

Weather Advisory — a special notice provided to a supported agency when an established weather condition that could affect its operation is occurring or is expected to occur.

Weather Warning — a special notice provided to a supported agency when an established weather condition of such intensity as to pose a hazard to property or life is occurring or is expected to occur. A weather warning is issued for situations that require the supported agency to take protective action.

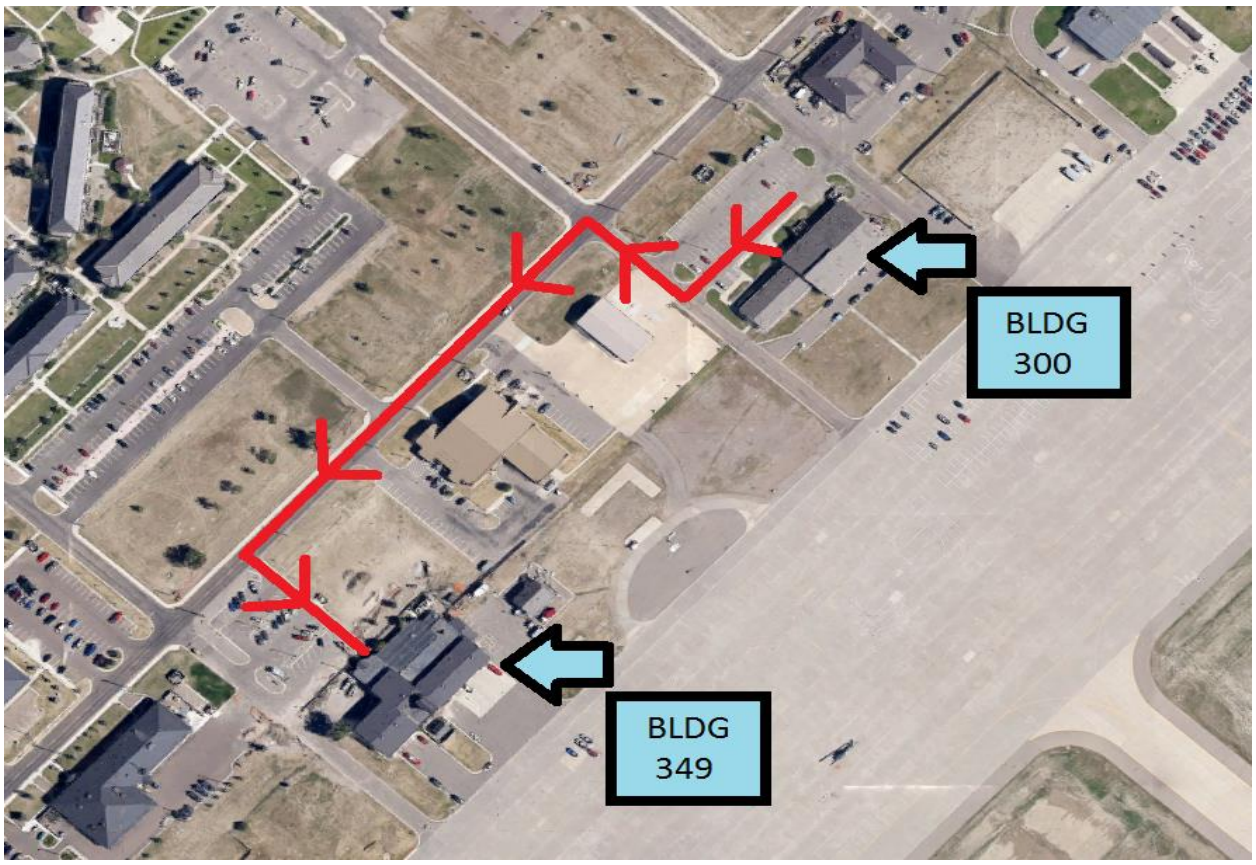
Weather Watch — a special notice provided to customers to alert them that atmospheric conditions are favorable for the development of severe weather. Watches will be upgraded to warnings if severe weather activity appears imminent.

Zulu — a system of time, also known as Greenwich Mean Time or Universal Time Coordinate, and is the local time for the Greenwich Observatory, Greenwich, England.

Attachment 2

ALTERNATE OPERATING LOCATION

Figure A2.1. Map to the Alternate Operating Location (Building 349, Fire Station)



Attachment 3

SAMPLE WEATHER PRODUCTS AND DECODING GUIDELINES

A3.1. Observations.

A3.1.1. Sample

METAR KGFA 301456Z AUTO 22008G15KT 6SM –RA OVC010 11/07 A3007 RMK AO2 SLP213 T01060067

(1)METAR (2)KGFA (3)301456Z (4)AUTO (5)22008G15KT (6)6SM (7)–RA (8)OVC010 (9)11/07 (10)A3007 (11)RMK (11.1)AO2 (11.2)SLP213 (11.3)T01060067

A3.1.2. Sample Breakdown

A3.1.2.1. Type of Observation. There are three types of observations:

A3.1.2.1.1. Meteorological Observation (METAR). This is an observation taken routinely in accordance with AFMAN 15-111.

A3.1.2.1.2. Special Observation (SPECI). This is an observation taken as a result of one of the special criteria (listed in attachment 4) being met.

A3.1.2.1.3. Local (LOCAL). This is an observation which is manually generated by the 341 OSS/OSW when backing-up the FMQ-22. They will only be done as single element observations for altimeter setting changes.

A3.1.2.2. Station Identifier. This is also called the International Civil Aviation Organization (ICAO). This code identifies the location of the observation (in this case KGFA=Malmstrom AFB).

A3.1.2.3. Date and Time. The date is the first two digits (30) and represents the 30th day of the month. The time is the next five characters (1456Z) and represents the time the last element of the observation was observed and transmitted in Zulu (GMT).

A3.1.2.4. Type of Observation. In this case it's "Auto" meaning automatically taken and transmitted.

A3.1.2.5. Wind. The first three digits provided the wind direction the wind is coming from in degrees (220). The next two digits is the sustained wind speed (08), G = gusts and the last two digits are the gust speed (15) measured in knots.

A3.1.2.6. Visibility. The furthest predominant distance (at least 50% of the aerodrome) that can be seen from the airfield, reported in statute miles (SM). The most common visibility reported is 7 miles, however, Malmstrom's FMQ-22 reports up to 10 miles.

A3.1.2.7. Present Weather. This is any weather phenomenon that is occurring on the airfield. This is mandatory anytime the visibility is less than 7 miles. Table A3.1. lists the present weather codes.

Table A3.1. Weather Phenomena Codes.

Qualifier		**Weather Phenomena**		
Intensity	**Descriptor**	**Precipitation**	**Obscuration**	**Other**
- Light	MI	DZ	BR	PO

	Shallow	Drizzle	Mist	Dust/Sand
Moderate	PR Partial	RA Rain	FG Fog	SQ Squall
+ Heavy	BC Patches	SN Snow	FU Smoke	FC Funnel Cloud or Tornado
VC Vicinity	DR Low Drifting	SG Snow Grains	VA Volcanic Ash	SS Sandstorm
	BL Blowing	IC Ice Crystals (diamond dust)	DU Dust	DS Dust Storm
	SH Showers	PL Ice Pellets (sleet)	SA Sand	
	TS Thunderstorm	GR Hail (≥1/2")	HZ Haze	
	FZ Freezing	GS Small Hail or Snow Pellets (graupel)	SP Spray	
		UP Unknown Precipitation		

A3.1.2.8. Key Condition and Cloud Height. At Malmstrom AFB, only clouds below 12,000ft (120) are reported. The first three characters describe the amount of clouds present at the airfield. They fall into the following categories:

CLR – Clear Sky (below 12,000ft)
FEW – Few; 1/8 to 2/8 coverage
SCT – Scattered; 3/8 to 4/8 coverage
BKN – Broken; 5/8 to 7/8 coverage
OVC – Overcast; 8/8 coverage
VV – Vertical visibility; normally used during heavy fog, indicates how far up into the fog can be seen.

The last three digits (none for SKC) is the height above the airfield of the clouds in hundreds of feet (080=08000 or 8,000ft and 110=11000 or 11,000ft).

A3.1.2.9. Air Temperature/Dew Point. These are in °C which negative temperatures designated with an M (M09 = -9°C).

A3.1.2.10. Altimeter. This is in inches of Hg (A3007 = 30.07 in Hg).

A3.1.2.11. RMK. This is the beginning of the "remark" section. A plethora of information can be added to this section (see Table A3.2 for commonly seen items). For simplicity, only the items in this example will be addressed.

A3.1.2.11.1. AO2. Automated site.

A3.1.2.11.2. SLP213. Sea Level Pressure in millibars (mb). If the digits are less than 700, then place a 10 in front and a decimal one from the end (213 = 1021.3mb). If that are greater than 700, place a 9 in front and a decimal one from the end (988 = 998.8mb)

A3.1.2.11.3. T01060067. Actual temperature and dew point. First four digits are temperature to one decimal place (0106 = 10.6°C) and the last four digits are dew point to one decimal place (0067 = 6.7°C).

Table A3.2. Common Remarks is RMK Section.

A02A – Automated site which is being augmented	
CB – Cumulonimbus	CONS – Continuous
DA – Density Altitude	DSIPTD – Dissipated
DSNT – Distant	FROPA – Frontal Passage
ESTMD – Estimated	LTG - Lightning
FRQ – Frequent	MOV – Moving
LWR – Lower	OCNL – Occasional
MOVD - Moved	OHD – Overhead
PA – Pressure Altitude	PK WND – Peak Wind
PRESFR – Pressure Falling Rapidly	PRESRR – Pressure Rising Rapidly
RWY – Runway	T – Towering
TCU – Towering Cumulus	TWR – Tower
UNKN - Unknown	VIS – Visibility
WSHFT – Wind Shift	STNRY – Stationary
$ - A fault with one of the sensors has been detected	

A3.2. Terminal Aerodrome Forecast (TAF). KGFA 2511/2617 31005KT 9999 SCT015 SCT250 QNH3015INS

BECMG 2514/2515 03009KT 9999 SCT027 BKN250 QNH3010INS
BECMG 2517/2518 12010KT 5000 SHRA SCT010 BKN025 OVC080 QNH3005INS
TEMPO 2519/2522 VRB10G20KT 0800 TSRA SCT008 BKN015CB OVC030 T24/2600Z T10/2610Z

The forecast follows the same general format as the observation with the following exceptions:

A3.2.1. Valid Date /Time. Forecasts are generally valid for a 30-hour period. In this example the forecast is valid from the 25th at 1100 Zulu (or GMT) until the 26th at 1700 Z.

A3.2.2. BECMG. This is a code to indicate that the predominant condition of the sky will change to (or become) the conditions listed in that line of the forecast. The conditions will change during the time period that follows the BECMG code (1400 to 1500 Z or 1700 to 1800Z in the above example).

A3.2.3. TEMPO. This code means that the conditions listed on that line may occur for periods of an hour or less (an hour and 15 minutes or less for thunderstorms) anytime between the time frame following the TEMPO code (1900Z to 2200Z in this example).

A3.2.4. QNH3015INS. Altimeter Setting 30.15 in Hg and is the lowest expected for the valid time period.

A3.2.5. Max Temp/Min Temp (T24/2600Z T10/2610Z). T24 indicates a maximum temperature in Celsius to occur at 00Z. T10 indicates a minimum temperature of 10 Celsius to occur at 10Z (note: M indicates a minus sign in front of the number: TM05 = -5 C).

A3.3. Weather Warnings Samples.

A3.3.1. Weather Advisory.

WEATHER ADVISORY
VALID 30/2200Z (30/1600L) TO 01/0600Z (01/0000L)
FRESH SNOW ADVISORY
FOR: 10TH MISSILE SQUADRON

SNOW ADVISORY FOR FRESH SNOWFALL 1/2" OR GREATER, BUT LESS THAN 6” IS EXPECTED FOR THE 10TH MS.

A3.3.2. Weather Watch.

WEATHER WATCH
VALID 02/1200Z (02/006L) TO 03/1800Z (03/1200L)
HEAVY SNOW WATCH
FOR: 490TH MISSILE SQUADRON

CONDITIONS ARE FAVORABLE FOR THE DEVELOPMENT OF 6” OR MORE OF FRESH SNOWFALL. A HEAVY SNOW WARNING WILL BE ISSUED WHEN 6” OR MORE OF FRESH SNOW IS IMMINENT.

A3.3.3. Observed Weather Warning.

WEATHER WARNING
VALID 30/2043Z (30/1443L) TO UFN
LIGHTNING WARNING
FOR: MALMSTROM AFB

LIGHTNING IS OCCURING WITHIN 5 NM OF MALMSTROM AFB.

A3.3.4. Forecast Weather Warning.

WEATHER WARNING
VALID 30/2100Z (30/1500L) TO 30/2300Z (30/1700L)
HAIL WARNING

FOR: 341ST MISSILE COMPLEX

THUNDERSTORM(S) PRODUCING 3/4” HAIL ARE CURRENTLY AFFECTING OR EXPECTED TO AFFECT, THE FORECAST AREA.

Attachment 4

SPECIAL WEATHER OBSERVING CRITERIA

A4.1. SPECI. A special weather observation (SPECI) will be taken and disseminated during airfield operating hours for criteria listed in this attachment.

A4.1.1. Ceiling (automated). When the ceiling goes below or, if below, increases to equal or exceed any of the values listed below:

Height (feet)
2000FT
1500FT
1000FT
700FT
500FT
300FT
200FT

A4.1.2. Visibility (automated). When visibility goes below or, if below, increases to equal or exceed any of the values listed below:

Visibility (statute miles)
3SM
2SM
1SM
1/2SM
1/4SM

A4.1.3. Weather (automated).

A4.1.3.1. Precipitation (any form).

A4.1.3.2. Thunderstorms.

A4.1.4. Weather (manual augmentation).

A4.1.4.1. Volcanic eruption when first observed.

A4.1.4.2. Hail (>3/4) begins or ends.

A4.1.4.3. Tornado, Funnel Cloud, or Waterspout.

A4.1.4.3.1. Observed.

A4.1.4.3.2. Disappears from sight.

A4.1.4.4. Upon Resumption of Observing Function.

A4.1.4.5. A Single-Element Special Observation. It is taken only when a delay in reporting all elements would cause an immediate threat of life or property (e.g., tornadoes).

A4.1.4.6. Real World Nuclear Accident (Special). When notified of a real world nuclear accident, a SPECI will be disseminated locally and long-line, append with the remark AEROB.

A4.1.4.7. Aircraft Mishap.

A4.1.4.8. Any other meteorological situation, which in the opinion of the weather personnel is significant to the safety of aircraft operations or resource protection.

Attachment 5

FORECAST SPECIFICATION AND AMENDMENT CRITERIA

A5.1. Specification criteria. The TAF will specify the time of occurrence, the duration, and the intensity (if applicable) of expected weather conditions. The following weather criteria will be specified in TAFs if expected to occur during the forecast period.

A5.1.1. Ceiling is forecast to decrease less than, or if below, is forecast to equal or exceed any of the following levels:

Ceiling (feet)
GTE 2000FT
LT 2000FT but GTE 1000FT
LT 1000FT and GTE 500FT
LT 500FT

A5.1.2. Visibility is forecast to decrease, or if below, is forecast to increase to equal or exceed any of the following value:

Visibility (statute miles)
GTE 3SM
LT 3SM but GTE 2SM
LT 2SM but GTE 1/4SM
LT 1/4SM

A5.1.3. A change in wind speed of 10 knots or more, or a change in wind direction greater than 30 degrees when the predominant wind speed or gust is expected to be in excess of 15 knots.

A5.1.4. Icing and/or turbulence at or below 10,000 feet not associated with thunderstorms.

A5.1.5. Precipitation.

A5.1.6. Any weather warning or advisory criteria that can be specified in the TAF.

A5.1.7. Thunderstorms.

A5.2. TAF Amendment Criteria. The TAF will be amended by the 25 OWS for the following amendment criteria listed:

A5.2.1. When the ceiling or visibility is observed, or later forecast, to increase to or exceed, or decrease to less than any of the following levels, and was not specified in the TAF.

Ceiling (feet)	Visibility (statute miles)
GTE 2000FT	GTE 3SM
LT 2000FT but GTE 1000FT	LT 3SM but GTE 2SM
N/A	LT 3SM but GTE 2SM
LT 1000FT and GTE 500FT	LT 2SM but GTE 1/4SM
LT 500FT	LT 1/4SM

A5.2.2. Wind Speed: The difference between the predominant wind speed and the forecast wind speed is > 10 knots and/or the difference between the observed gusts is > 10knots from

the forecast gust. For example, amend a forecast specifying surface winds of 23018G25kt if observed predominant wind speed is 28 knots or more, or if the observed gusts are 35 knots or higher. Similarly, amend the TAF if predominate winds are 8 knots or less, or gusts are 15 knots or less. Wind Direction: A change >30 degrees when the predominant wind speed or gusts are expected to be over 15 knots.

A5.2.3. Precipitation when:

A5.2.3.1. Unforecasted freezing precipitation begins or ends.

A5.2.3.2. the beginning or ending of precipitation causes local weather warnings or advisories that can be specified in the TAF, to be issued, canceled or amended.

A5.2.3.3. the forecaster considers the occurrence or nonoccurrence of precipitation to be operationally significant.

A5.2.4. Icing, not associated with thunderstorms, from the surface to 10,000 feet AGL. The beginning or ending of icing first meets, exceeds, or decreases below light or greater thresholds and was not specified in the forecast.

A5.2.5. Turbulence (for Cat II aircraft), not associated with thunderstorms, from the surface to 10,000 feet AGL is expected. The beginning or ending of turbulence first meets, exceeds, or decreases below light or greater thresholds and was not specified in the forecast. Note: the 341 OSS/OSW tailors this information to account for CAT 1 aircraft.

A5.2.6. Weather warning and/or TAF amendable weather advisory criteria:

A5.2.6.1. Occur, or are expected to occur, during the forecast period, but were not specified in the forecast.

A5.2.6.2. Were specified in the forecast, but are no longer occurring or expected to occur during the forecast period.

A5.2.7. Specification of Temporary Conditions: Forecast conditions specified as temporary become predominant conditions. Forecast conditions specified as temporary do not occur as forecast. Forecast conditions specified as temporary are no longer expected to occur.

A5.2.8. Changes to Predominant Conditions: Forecast change conditions (BECMG group) occur before the beginning of the specified period of change and are expected to persist. Forecast change conditions (BECMG group) do not occur by the specified time. Forecast change conditions (BECMG group) are no longer expected to occur.

A5.2.9. Representative Conditions: Forecast conditions are considered unrepresentative of existing or forecast conditions and amending the forecast improves safety, flight planning, operations efficiency, or assistance to in-flight aircraft.

Attachment 6

BEELINE/OPREP3 REPORTING

Figure A6.1. Beeline Reporting.

BEELINE: 341 MW, MALMSTROM AFB MT, AT _____. (NOTE 1), THE 341 MW COMMAND POST WAS NOTIFIES OF (SELECT ALL APPROPRIATE)
_____ HAIL ≥ 3/4" (ACTUAL OBSERVED _____INCHES) _____ TORNADO _____ HEAVY SNOW (≥6") _____FREEZING PRECIP _____ BLIZZARD _____ Other Specify:_____
OCCURING AT _____(NOTE 2)
THE FORECAST AT THE TIME OF OCCURANCE CALLED FOR _____
AT _____(NOTE 1) A (circle: WATCH, ADVISORY, WARNING) FOR _____(ENTER FORECAST CRITERIA) WAS ISSUED, PROVIDING _____ MINUTES LEAD TIME. THE DESIRED LEAD TIME IS _____ MINUTES.
ALL METEOROLOGICAL EQUIPMENT WAS OPERATIONAL EXCEPT (circle appropriate: WEATHER RADAR, FMQ-22, RAWS (A,B,G,K,O), WEATHER DISSENMINATION SYSTEM, (OTHER)_____)
REMARKS (include damage and or mission impacts):_____ _____ _____ _____ _____
NOTES: (1) ENTER DATE/ TIME OF OCCURRENCE (e.g., 4/1500ZJUN01) (2) ENTER LOCATION (e.g., XXX AFB, 5 NM NORTH OF XXX AFB) In accordance with AFI 10-206, Rule 8I. a. REQUIRED: When the following significant weather occurs and results in damage: 1. Hail ≥ 3/4 inch 2. Tornadoes 3. Heavy Snow (≥ 6") 4. Freezing Precip 5. Blizzard b. BEELINE REPORT CONTENT: 1. Actual severe weather experienced 2. Forecast valid at the time of occurrence to include any watches or warnings issued (include actual and desired lead time, etc.) 3. Operational status of meteorological equipment (e.g., radar, wind sensors, etc.) at time of event.

4. IMPACT/damage is not required but is desired.